Since the commencement of the Society's Bird Banding Scheme approximately 4,000 rings have been issued to members and others interested in the migration of wildfowl. So far 26 birds have been recovered of which 13 were recovered in India either in the same year as they were ringed or on return from their breeding rounds. The remaining 13 were reported to have been captured or shot outside Indian limits, chiefly in Siberia.

Owing to the absence of properly organised Bird Banding Stations in India the ringing of wildfowl has been confined to ducks in places where they are regularly snared or shot.

Bombay Natural History Society,
Bombay. EDITORS.
January 1936.

XXV.—DO BIRDS EMPLOY ANTS TO RID THEMSELVES OF ECTOPARASITES?

In the course of our collaboration in the account of the birds of Bombay and Salsette (to be published in this *Journal*) my cousin Humayun Abdulali recently sent me the following note on Jerdon's Chloropsis [*Chloropsis jerdoni* (Blyth)].

'On 8 September 1934 I observed a pair catch and eat Red Ants (*Oecophylla smaragdina*) on a mango branch. The ants were captured in the beak and then quickly but deliberately rubbed into the tail feathers before being swallowed. Every ant captured was scrupulously treated in this peculiar fashion.'

He speculates that the ant is crushed and the sac-like abdomen bursts in the process discharging formic acid 'which may be absorbed by the fluffy tail-coverts' (?)

As far as I am aware, a similar observation has not been made in India before and Abdulali deserves credit for *recording* what most people would have considered far too trivial or 'original' to bother about. The instance only shows—if an example were needed—how much there is still to be learnt by an unprejudiced study of the *live* bird.

Referring to literature, it is interesting to find that the same question as heads this note was put forward by Dr. E. Stresemann in the *Ornithologische Monatsberichte* for July-August 1935 (p. 114). He pointed out that the expected discussion had not been produced by the publication of H. Heine's note in *Orn. Monatsb.* in 1929 (p. 188) under the title 'Crows use Ants to get rid of Ectoparasites', but that he had now, for the first time, found quite similar observations recorded in the recent book by A. H. Chisholm, *Bird Wonders of Australia* (Sydney, 1935), pp. 153-5.

In the note referred to, Heine had observed some Hooded Crows (*Corvus cornix*) deliberately seeking an ant-hill of *Formica rufa* and squirting or allowing themselves to be squirted with formic acid in order, the author presumed, to rid themselves of ectoparasites. Mr. Chisholm in his book, describes European Starlings (*Sturnus vulgaris*) introduced into Australia, taking ants in their bills and sticking them deliberately under their wings, and also suggests that the object of this behaviour was to expel or kill

the ectoparasites by means of the formic acid exuded by the squashed insects.

A number of very interesting notes on similar observations from readers of *Ornithologische Monatsberichte* followed the above communication by Dr. Stresemann, and these are published in the September-October issue of that *Journal* (pp. 134-8). Aggregately they indicate that without doubt this habit is widely and regularly practised by many species of birds, especially of the tropics.

Kleinschmidt refers to a short communication published in a sporting paper as far back as 1911, of a tame Magpie (*Pica pica*) eagerly seeking all available cigar stumps and rubbing them into its plumage. *Apropos* of this note, Dr. Heinroth observed at the time that Starlings do something similar with live ants and that a young Dipper (*Cinclus cinclus*) was seen by himself and his wife to catch the insects in the tip of its bill and rub them deliberately through its wing feathers. The ant was then dropped, a fresh one seized and the action was repeated on the feathers of the abdomen and thighs. It would be assumed, naturally enough, that the bird did so to get rid of vermin, but Dr. Heinroth further remarked that several young dippers taken by him from the nest and who could not have had a similar experience before, acted in precisely the same manner although no trace of any parasites could be detected on them, a fact which suggests that the reaction is wholly instinctive.

Other writers also recorded similar observations with crows and starlings, of these birds not only sticking the insects into their feathers, but literally 'bathing' in a swarm of ants. Herr Neunzig observed that caged *Leiothrix* and several species of *Garrulax* will even stick mealworms into their plumage. From this, Dr. Kleinschmidt speculates that it may perhaps be the pleasant sensation produced by insects crawling through their plumage—akin to that produced by stroking a bird's nape with the fingers, which it so obviously enjoys—that induces birds to behave in this manner.

One correspondent mentions that his tame Carrion Crow (*Corvus corone*) 'bathes' as often as it can in ant swarms with much apparent relish, one such bath lasting for 25 minutes! The bird gathers a number of ants in its bill, squashes them, rubs them through its plumage and then casts them away in the form of a pellet and gathers more. The same observations have been made with captive *Chloropsis* species and with the thrushes *Turdus musicus* and *T. philomelos*.

A. Troschütz is quoted as writing in *Gefiederte Welt* (1931, p. 484) as follows: A peculiarity which only some exotic birds (*Leiothrix lutea*, *Lioptila capistrata*, etc.) and the Thrushes have in common is their predilection for ants, not as food but for rubbing into their thighs, rump and wings. The formic acid has probably some beneficial effect, but whether it helps to eradicate parasites or acts as some form of general tonic is doubtful. In the case of his tame crow, at any rate, Herr Troschütz doubts if it can be the former, since the bird takes plenty of water baths and keeps itself scrupulously clean.

The notes published deal in all with the following species of

birds, both captive and in a wild state: Magpie (*Pica pica*), Jay (*Garrulus glandarius*), Starling (*Sturnus vulgaris*), the crows *Corvus corone* and *C. cornix*, *Leiothrix lutea*, *Lioptila capistrata*, *Garrulax* spp., *Chloropsis* spp., the thrushes *Turdus musicus* and *T. philomelos* and the Dipper (*Cinclus cinclus*).

Besides ants, which are regularly and deliberately rubbed through the plumage by all of them, there are other things which have also been observed to be similarly utilised. Cigar ends and mealworms have been mentioned before, and 'Flohkrebs' (?) and many acid fluids such as lemon-juice and vinegar are among the others.

Formic acid—first discovered by Rey in 1670 by distilling red ants (*Formica rufa*)—is well known to be a powerful antiseptic, and ants rubbed into the feathers of a bird would indeed effectively rid them of noxious insects as has been generally suggested. Mealworms and 'Flohkrebs' (evidently some sort of caterpillars?) require closer investigation, although it is known that formic acid is also formed in the acid secretions of certain caterpillars.

Tobacco-juice or decoction is commonly sprayed by gardeners to ward off insect pests and is also widely and effectively used by jungle people to deter leeches from climbing up their legs and for dropping off partly satiated ones. Moreover, it is common knowledge that a slice of lemon rubbed on to the arms, neck etc. will discourage bites of mosquitoes and sandflies (*Culicidae* and *Psychodidae*) and it seems very probable that lemon-juice (*citric acid*) may have a similarly repellent action on lice (*Mallophaga*), ticks and other ectoparasites of birds. It is not difficult to conceive, therefore, that in the above cases, the cigar-ends, lemon-juice, vinegar etc. may all have been instinctively employed by the birds for this purpose although the immediate need was not apparent.

As Dr. Stresemann points out in his summing up, however, the assumption that the ridding of parasites is the real object of this behaviour is merely a conjecture so far, albeit a very plausible one. It is hoped that this note will provoke further observation and experiment.

Curiously enough in none of the observations referred to is there a suggestion that the ants were *eaten* by the birds at the time or after being rubbed through the feathers, and in this Humayun Abdulali's note differs from the rest. Ants in varying degree form the food of so many bird species in India that there is nothing remarkable about this part of his observation, but the effect of formic acid taken internally is of some interest. Taken by mouth or hypodermically, it is said to give tone to the muscles, increase muscular energy and abolish the sense of fatigue.[1] The Stinging Nettle (*Urtica dioica*) which also contains formic acid, has long been employed as a tonic and diuretic, and it may be for this and the other beneficial properties that red ants are eaten by the Santāls, a typical Dravidian tribe of Chōta Nāgpūr.[2]

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[1] Martindale and Westcott, *The Extra Pharmacopeia*, 19th edition, 1928, vol. i, p. 34.

[2] Sir George Watts, *Dictionary of Economic Products of India*, vol. i, p. 264.

In addition to formic acid, ants also contain a small amount of formaldehyde and at a certain stage these may be chemically acted upon by the gastric secretions of the bird and converted into glucose which is a very valuable food material. It is conceivable also that at times the formic acid from the squashed and swallowed ant may have the effect of ejecting endoparasites with which we know birds are commonly afflicted.

Dr. Stresemann suggests the use of a special term for this 'rubbing in' process on a par with preening which may be translated into English, and henceforth used, as 'anting',—e.g. a bird ants itself or its feathers, even when objects other than ants (necotine, lemon-juice, mealworms etc.) are used in the process.

DEHRA DUN. SĀLIM ALI.

November 11, 1935.

XXVI.—GECKOS AND SUPERSTITION.

Many reptiles have given rise to superstitious notions the world over, and lizards have also made their contribution in this direction. Having been engaged in the preparation of a detailed memoir on the common Indian wall-lizard (*Hemidactylus flaviviridis* Rüppel) for the last two years, I have been much interested in the prevalent superstitions about geckos. Some of the results of my search are given below.

Flower[1] says, '"Bors", or "Abu Bors", is, as it was in the time of Forskaal, the common name for any Gecko in Egypt. Better-informed people may tell you that it is "Abu Boris", to fit better with the words used by Damiri, "Abou Baris" (Jayakar's translation, *1*, p. 352) and "Sâm Abras" (o.c. *2*, p. 23), meaning respectively "Father of leprosy" and "Poison of a leper." Damiri wrote: "One of the characteristic qualities of this animal is that, when it settles down in salt, it rolls about in it, giving rise to what becomes the means of producing white leprosy."

'It should be mentioned that some of the desert Arabs, who know more about lizards than the Fellaheen do, include under the term "Bors" the Red-spotted Lizard *Eremias rubropunctata*: I do not know why. They believe in poisonous and non-poisonous lizards: a non-poisonous lizard may be known by its running fast for a short distance and then stopping suddenly—for it has remembered it has no poison!'

The bite of house-geckos is generally, though erroneously, regarded as poisonous and Roberts[2] describes ten native remedies for it. Even the saliva[3] of these creatures is believed by some people to be highly emetic. According to an article in *Encyclo-*

[1] Flower, S. S., 'Notes on the Recent Reptiles and Amphibians of Egypt, with a list of the Species recorded from that Kingdom.' (*Proc. Zool. Soc.*, 1933, pp. 742-3.)

[2] Roberts, E., 'Native Remedies used in Snake-Bites, etc.' (H. W. Cave & Co., Colombo, 1919, pp. 41-3.)

[3] Prof. N. M. Antani, St. John's College, Agra, tells me that the dropping of a house-lizard's saliva in milk is believed by the people of Gujarat to make the latter highly poisonous.